SPEED LEARNING

APPLICATIONS FOR AEROSPACE CAREERS

NASA / CICT

ADVANCED AEROSPACE TECHNOLOGIES COURSE

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Introduction

- Background
- Common Ground With NASA
- Research Work in Fluent Reading (Speed Reading / Speed Learning)
- Fluent Reading is Effective & Efficient Speed Reading
- Fluent Readers Read Better and Faster, With Improved Comprehension and Recall
- NASA Memorandum of Understanding

NASA Needs Include

- Aerospace Familiarization / Unique Staff Training / Occupational Adaptation
- Improved Time Management (“Doing” Vs. “Learning”)
- Common Technical Languages for Unique Projects and Programs (ex. ISS “Express Language”)
- Rapid Assimilation of Complex Databases (Visualization and Comprehension)

Sample Learning Challenges - NASA Phrases and Acronyms

- Argument of periapsis -The argument (angular distance) of periapsis from the ascending node
- DSN - Deep Space Network
- EDR - Experiment Data Record
- ISS required over 128,000 pages of technical translation
- JSC/JLEC now uses 20,000 Common Words for ISS (International Space Station)

Research Work

- Increased Reading Speed and Comprehension
- Baseline Technical Languages
- Employee Training Opportunities / Adaptation
- Improved Visualization
- Rapid Assimilation of Data

What We'll Cover

- Understanding what works (and what doesn't)
- Emerging Research
- Application to Your Studies
- Applying it to Aerospace or Technical Occupations

Using The Scientific Method

- Problem Statement
- Current Research Baseline
- Approach and Materials
- Observations/Data/Results
- Analysis
- Conclusion

Problem Statement

- Most Readers Read at a Rate of 150-250 Words Per Minute
- This Speed Is Inadequate for the Rate of Change in a High Technology Workplace

Considerable Field Research to Date

- **Theoretical Articles** Are Concerned With the Theory of How People in General Process Written Texts. These Studies Describe and Evaluate Models of the Reading Process.

- **Descriptive Studies** Involved the Use of Systematic Data Collection to Characterize the Instructional Setting or the Characteristics of the Learners Themselves

Considerable Field Research to Date

- **Experimental Studies** Used Systematic Data Collection Techniques to Evaluate the Reading Ability of Learners, Either As the Result of One Type of Pedagogy or Another or to Quantify the Effects of Specific Factors in the Reading Process.

- **Practitioner Research Studies** Are Those in Which the Researcher Is Also Involved As the Classroom Instructor.

- The Latter Two Offer the Most “Real World” Applications -

Federal Findings

Federal “No Child Left Behind” Study Finds:

- Approximately 40% of Students Across the Nation Cannot Read at a Basic Level
- Almost 70% of Low-income Fourth Graders Cannot Read at a Basic Level

Federal Findings

Federal “Reading First” calls to improve:

- Phonemic Awareness
- Phonics
- Fluency
- Vocabulary
- Comprehension

Other Recent Findings

Third Grade – Reading at a 3rd Grade Level by the 3rd Grade Means Reading With Oral Fluency, I.E., Reading One Word at a Time, Out Loud

After Third Grade Students Enter a World Requiring Silent Reading Skills,.I.E, the Opposite of Oral Reading Skills

Silent Reading Skills Demand That Students Read More Than One Word at a Time, and Do Not Vocalize Words As They Are Read

Other Recent Findings

- Fourth Grade – Students Who Enter Fourth Grade, Armed Only With Oral Reading Skills Are Defined As Slow Readers… They Experience the Fourth Grade Slump/cliff
- Slow Readers in 4th Grade Are Slower Readers in High School and As Adults
- Currently There Is Little Support for Reading Programs After Third Grade in Secondary and Post Secondary Education (Other Than ESL)
- Effective Reading Skills Are Critical to Personal and Professional Success

Other Recent Findings

Average Reading Speeds at Various Grades (WPM)

1st)	80	2nd)	115	3rd)	138	4th)	158
5th)	173	6th)	185	7th)	195	8th)	204
9th)	214	10th)	224	11th)	237	12th)	250

College) 280

The Vast Majority of Students Can Learn to Read
2 to 3 Times Faster!

Research Observations

- Most Students Are Taught by Learning to Read Aloud
- Sounding Out Words Limits Reading and Learning Speed to Spoken Rates
- Learned Issues Include Recognition, Fixation, Sub-vocalization, Other “Reading Aloud “ Issues
- Effective Readers Can Read at a Rate of 800 to 1,000 Words or More Per Minute

Hypothesis

- Many Readers Are Taught to Read Incorrectly From the Beginning (Ex. Look-say / Phonetic)
- To Become a Fluent Reader, to Learn Effective and Efficient Speed Reading, One Has to Unlearn the Habits of Slow Readers and Learn the Habits of , Effective and Efficient Readers.
- Reading With Your Mind (Silently) Can Increase Your Reading by Four Times It's Current Rate… While Improving Comprehension and Recall or Expand Comprehension

Field Test Example

- Read (Just jump in)

-or-

- Pre-Read
- Read
- Post-Read

Next Step: Try reading with technical assistants

Field Tests / Equipment

- Electronic / Written Standardized Tests
- Eye Movement Exercises/Tests
- Readers / Drillers / Pacers
- Other Software

Summary

- Speeds of 10,000 + Words Per Minute Have Been Claimed (With Little Substantiation)
- Speeds of 800-1,200 Words Per Minute (With No Loss of Comprehension) Have Been Documented
- Follow-up Assertion: With “Prime Word” Phrases Occupational Adaptation and Knowledge Assimilation Can Be Cut in Half

Prime Word Technology

- Concepts That Go Beyond Mere Speed Reading
- Learning and Mastering Prime Words Can Speed up Assimilation and Rapidly Expand Comprehension (Speed Learning)
- Research of Over 12,000 Texts and 548 Million Words Indicates That Approximately 90% of All Words in Print Utilize Less Than 2,500 Words.
- These Words Are Termed Prime Words

Prime Word Technology

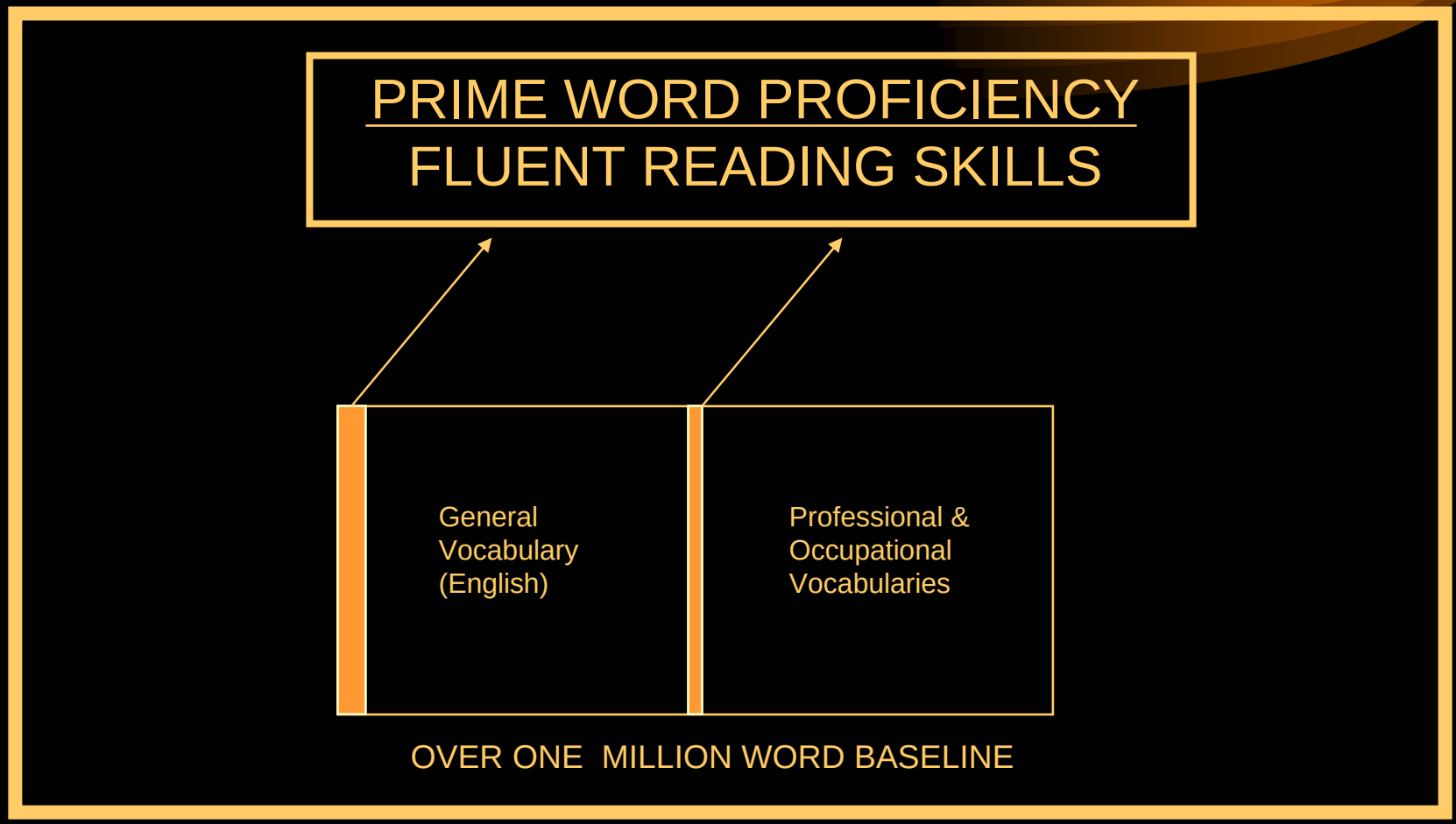
Every occupation has its own vocabulary, including vital words, acronyms and phrases:

- Aerospace - 20.000 words
- Aviation - 35,000 words
- Chemistry - 28,000 words
- Computer Science - 15,000 words
- Elec Engineering / Electronics - 16,000 words
- Mech. Engineering - 15,000 words
- Mathematics - 15,000 words
- Physics- 14,000 words

Prime Word Technology

- Less Than 2,500 Prime Words Cover 70% of All Words in Print in Books, Magazines, Newspapers, Etc.
- Normal Reading Material Uses Less Than 2,000 Words.
- 300 to 500 Prime Words in Professional or Vocational Areas Cover 20% of All Additional Words in Peculiar to These Professional or Vocational Areas (frequency of use)
- 90% of Everything an Individual Reads in Their Personal and Professional Life Is Composed of Less Than a 2,500 Prime Word Vocabulary

Effective, Efficient Application Is The Goal



Prime Words and Silent Reading

- Recall That the Goal of Silent Reading Is to See, Read and Process More Than One Word at a Time, With Each Eye Fixation, Without Vocalizing

- Prime Words Have Three Key Characteristics
  - Immediately Recognizable
  - Do Not Need Decoding
  - The Eye Does Not Fixate on Them When They Are Read

Prime Words and Silent Reading

- Mastering a 2,500 Prime Words Vocabulary Will Be a Major Factor in Learning Fluent Reading Skills.

- Students Who Have Mastered a 2,500 Prime Words Vocabulary… 2,000 General Words and 300 to 500 Vocational Areas Words Will:
  - Read Faster and Better
  - Have Improved Comprehension of the Material Read
  - Have Improved Recall of the Material Read

- Mastering Relevant Prime Words Will Rapidly Increase Your Professional or Occupational Fluency

Prime Word Concepts

Thermal Hydraulic Coupler

Which is Better?

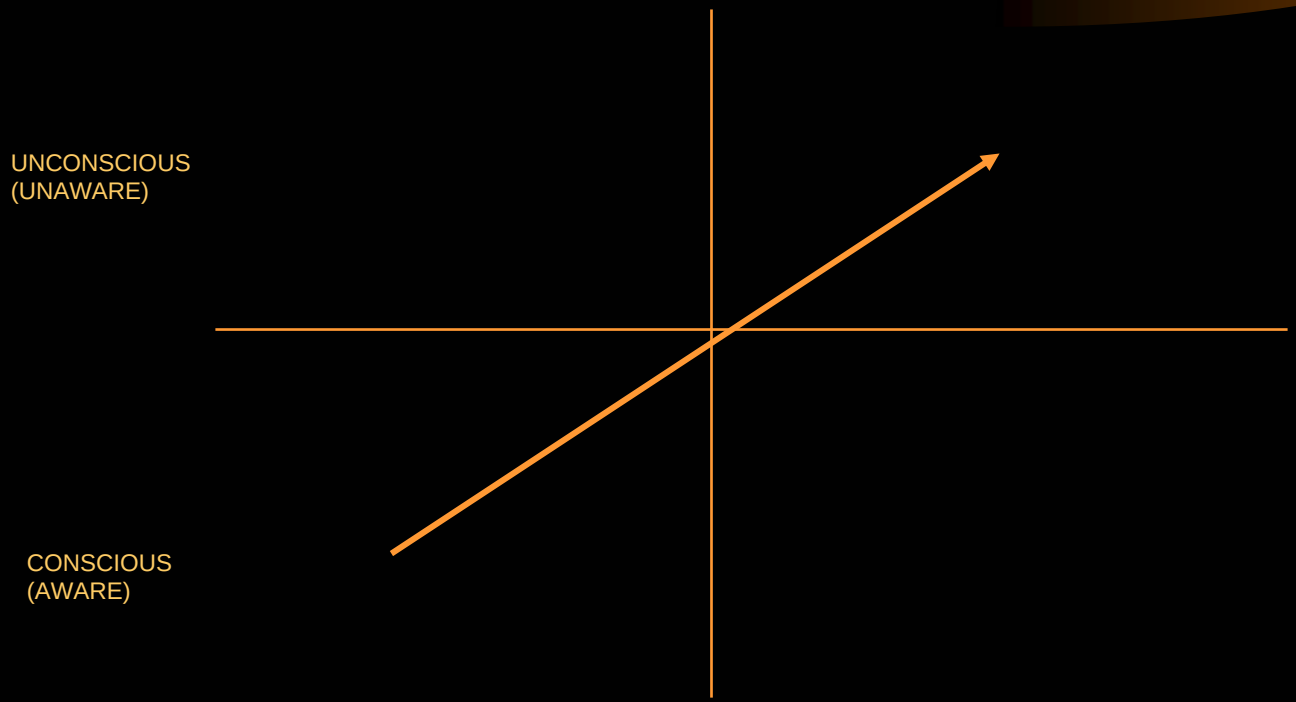
“Thermal” “Hydraulic” “Coupler” or “Thermal Hydraulic Coupler”






Desired Results

We can readily move from “Conscious Incompetence” to “Unconscious or Automatic Competence”



Next Steps

- Expanding Our Current Research and Development
- Continued NASA Teaming
- Department of Education Effort/Partnership
- Department of Labor Effort/Partnership
- University Collaborations… Joint R&D
- HUD Neighborhood Networks Field Work
- Boys and Girls Clubs of America Field Work

The Bottom Line

"The person who doesn't read good books has no advantage over the person who can't read them."

- Mark Twain

-- Thank you for your time and attention --